January 15, 2004

NRC 2004-0006
10 CFR 50.54(f)
BL 2003-02
Order EA-03-009

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Point Beach Nuclear Plant Unit 2
Docket 50-301
License No. DPR-27
60-Day Report Pursuant to NRC Bulletin 2003-02 and NRC Order EA-03-009 for
Point Beach Nuclear Plant Unit 2 Reactor Vessel Inspections

Reference: 1) *NRC Order EA-03-009, "Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads At Pressurized Water Reactors," dated February 11, 2003.*

2) *NRC Bulletin 2003-02, "Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity," dated August 21, 2003.*

3) *Letter from Nuclear Management Company, LLC (NMC), to NRC, "Nuclear Regulatory Commission Bulletin 2003-02: Leakage From Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity – 30-day response," dated September 22, 2003 (NRC 2003-0089).*

References 1 and 2 promulgated information and requirements regarding reactor pressure vessel (RPV) inspections.

Reference 1 requires that visual inspections be performed to identify potential reactor coolant system leaks from pressure-retaining components above the RPV head and that a report detailing the inspection results of the RPV head be provided within 60 days after returning the plant to operation.

Reference 2 requested information regarding the RPV lower head penetration inspection program and a summary of the inspections performed within 60 days of plant restart following the next inspection of the RPV lower head penetrations. In reference 3,

A109
A101

NMC committed to attempt a 100% bare-metal visual exam of the lower RPV dome up to and including each bottom-mounted instrumentation (BMI) penetration to RPV junction during the upcoming Unit 1 and Unit 2 refueling outages.

In accordance with the above, NMC is providing the 60-day response for the Point Beach Nuclear Plant (PBNP) Unit 2 refueling outage (U2R26).

Enclosures 1 and 2 to this letter contain summaries of the inspections conducted following U2R26 in response to references 1 and 2, respectively.

This letter contains no new commitments and no revisions to existing commitments.

I declare under penalty of perjury that the foregoing is true and accurate. Executed on January 15, 2004.

A. J. Cayia
Site Vice President, Point Beach Nuclear Plant
Nuclear Management Company, LLC

Enclosure 1: Results of the 2003 Unit 2 RPV Head Inspection
2: Results of the 2003 Unit 2 RPV Lower Head Penetrations Inspection

cc: Regional Administrator, Region III, USNRC
Project Manager, Point Beach Nuclear Plant, USNRC
Resident Inspector, Point Beach Nuclear Plant, USNRC

ENCLOSURE 1
NRC ORDER EA-03-009
POINT BEACH NUCLEAR PLANT 60-DAY RESPONSE
UNIT 2 RPV UPPER HEAD PENETRATION INSPECTION SUMMARY

The NRC issued Order EA-03-009 on February 11, 2003, establishing interim inspection requirements for reactor pressure vessel (RPV) heads of pressurized water reactors. In Section IV.E of the Order, the NRC required that the inspection results be provided within 60 days of the plant being returned to operation. Nuclear Management Company, LLC (NMC), hereby submits the inspection results for the Point Beach Unit 2 Fall 2003 refueling outage (U2R26).

Plant Susceptibility Category

The Point Beach Unit 2 RPV closure head had approximately 16.6 effective degradation years (EDY) at the start of the U2R26. The inspection category for this plant, as identified in the Order, is High. The corresponding inspection method specified in Section IV.C.(1) is as follows:

(1) For those plants in the High category, RPV head and head penetration nozzle inspections shall be performed using the following techniques every refueling outage.

(a) Bare metal visual examination of 100% of the RPV head surface (including 360° around each RPV head penetration nozzle), AND

(b) Either:

(i) Ultrasonic testing of each RPV head penetration nozzle (i.e., nozzle base material) from two (2) inches above the J-groove weld to the bottom of the nozzle and an assessment to determine if leakage has occurred into the interference fit zone, OR

(ii) Eddy current testing or dye penetrant testing of the wetted surface of each J-groove weld and RPV head penetration nozzle base material to at least two (2) inches above the J-groove weld.

Inspection Scope and Method

RPV Head Visual Inspection

A bare metal visual inspection (VT) of the RPV head top surface, including 360° around each RPV head penetration nozzle, was performed as identified in section IV.C.(1)(a) of the NRC Order. The VT was performed directly by inspectors through the use of mirrors, direct lighting, and video probe mounted on a remotely operated magnetic crawler.

There were no limitations in inspection coverage.

RPV Head Penetration NDE Inspection

The ultrasonic (UT) examination technique option, identified in Section IV.C.(1)(b)(i) of the NRC Order, was performed on all of the 49 reactor vessel head penetration (VHP) nozzles and one (1) vent nozzle. The inspection included the nozzle base material from two inches above the J-groove weld, down to the bottom end of all of the penetrations.

All nozzles without thermal sleeves (16) were examined using a rotating probe UT technique. The remaining penetrations containing thermal sleeves (33) were examined using a blade probe UT technique. The vent line was examined with a rotating UT probe specifically designed for the nozzle.

As part of the UT examinations, the 49 penetrations with interference fit design (excluding the vent) were assessed to determine if leakage had occurred into the interference fit zone. This assessment used the Framatome-ANP proprietary "leak path" technique.

Because the vent line is not an interference fit nozzle, a clean visual inspection provides a direct determination that no leakage has occurred into the annulus. However, as an added conservatism, the flush pressure boundary surface inside of the RPV head associated with the vent line (the head vent line, Alloy 600 attachment weld) was examined using the liquid penetrant (PT) examination method.

Inspection Results Summary

RPV Head Visual Inspection Results

The overall condition of the Point Beach Unit 2 RPV head was very good. The examination resulted in an effective visual examination that revealed no evidence of boric acid deposition or wastage of the reactor pressure vessel (RPV) head. All RPV head penetrations were examined with no limitations or masking.

RPV Head Penetration NDE Inspection Results

The overall condition of the Point Beach Unit 2 VHP nozzles was very good. There were no indications of leakage or flaws identified in any of the 49 VHPs or in the vent line of the Point Beach Unit 2 RPV head.

Conclusion

NMC has complied with the requirements of the NRC Order (EA-03-009) for the Point Beach Unit 2 Fall 2003 refueling outage (U2R26). Based on the results of the visual examinations, UT examinations, & leak path assessments (including PT of the vent) NMC concludes that the VHP nozzles that are returning to service are not degraded, and no wastage has occurred of the RPV head.

ENCLOSURE 2
BULLETIN 2003-02
POINT BEACH NUCLEAR PLANT 60-DAY RESPONSE
UNIT 2 LOWER HEAD PENETRATION INSPECTION SUMMARY

NRC Bulletin 2003-02 requested information regarding the reactor pressure vessel (RPV) lower head penetration inspection program and a summary of the inspections performed within 60 days of plant restart following the next inspection of the RPV lower head penetrations. NMC committed to attempt a 100% bare-metal visual exam of the lower RPV dome up to and including each bottom-mounted instrumentation (BMI) penetration to RPV junction during the upcoming Unit 1 and Unit 2 refueling outages. Nuclear Management Company, LLC (NMC), hereby submits the inspection results for the Point Beach Unit 2 Fall 2003 refueling outage (U2R26).

Summary of Inspections Performed

The lower RPV insulation was removed to perform a visual exam of the lower Reactor Pressure Vessel (RPV) dome including each bottom-mounted instrumentation (BMI) penetration to RPV junction. No indications were observed that were similar to the South Texas Project Unit 1 deposits. There was no boric acid buildup present at any BMI to RPV annulus. In addition, no indications were observed that were similar to any of those depicted in Electric Power Research Institute (EPRI) technical guidance for inspecting RPV heads. There were no indications of RCS leakage from any BMI penetration.

Method and Extent of Inspection

Each of the 36 BMI nozzles were examined completely around their circumference. In addition, the adjacent bare metal of the lower RPV surface was inspected up to six (6) inches above the highest BMI penetration.

The visual examination was accomplished utilizing VT-2 certified personnel. The examinations were performed directly, with a resolution capability of VT-1. Direct lighting was provided during the inspection. All BMI nozzles were photographed utilizing digital cameras.

As-Found Condition of Point Beach Nuclear Plant Unit 2 Lower Head

The general condition of the bottom of the vessel was very good. Some minor rust staining was observed coming down the side of the RPV. These indications had no volume and were determined to be a result of historical cavity seal ring leakage. This determination was made through direct visual exam and by the comparison of past photographic evidence.

In addition, it was noted that there was white residue on the nozzle to tube weld region of multiple BMIs. This residue was evaluated to be remnants of liquid penetrant (PT) developer. These remnants were attributed to incomplete cleaning during original vessel construction and did not mask any aspect of the inspection.

Following completion of the inspections, the lower RPV insulation was completely replaced with insulation of a new design. This new insulation is installed with inspection ports to permit ease of access during subsequent inspections of the PBNP Unit 2 BMI penetrations.